

# Gunnery Department MLRS Division

*“Standards Start Here”*



# *Field Artillery Officer Basic Course*

## *MLRS INTRODUCTION*

# ***Branch Information***

**Senior Officer Instructor: SFC York**

**NCOIC Officer Instruction: SFC Joyner**

**SFC Hensch**

**Mr. David Allen**

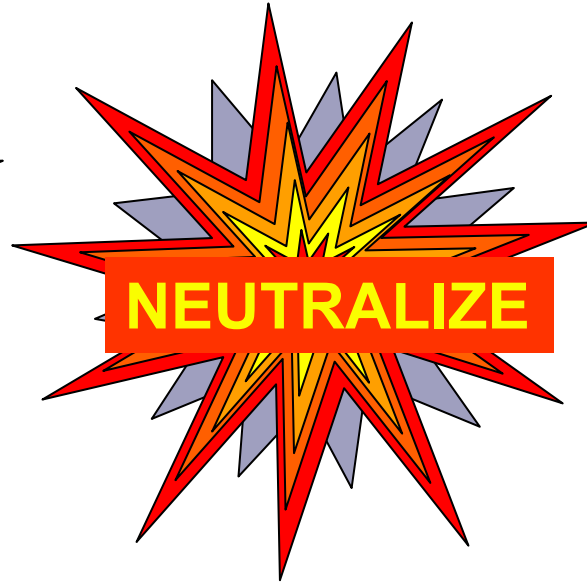
**Mr. Charles Moore**

**Phone numbers:**

**DSN 639- COM 442-5151 / 4743 / 4964**

**Offices: Critz Hall Bldg #812**

# ***The Mission of the Field Artillery is to ...***



the enemy by cannon, **ROCKET** and **MISSILE** fire  
and to help integrate all fire support assets into  
combined arms operations.



# ***MLRS Introduction***

## ***“Steel Rain on the Battlefield”***



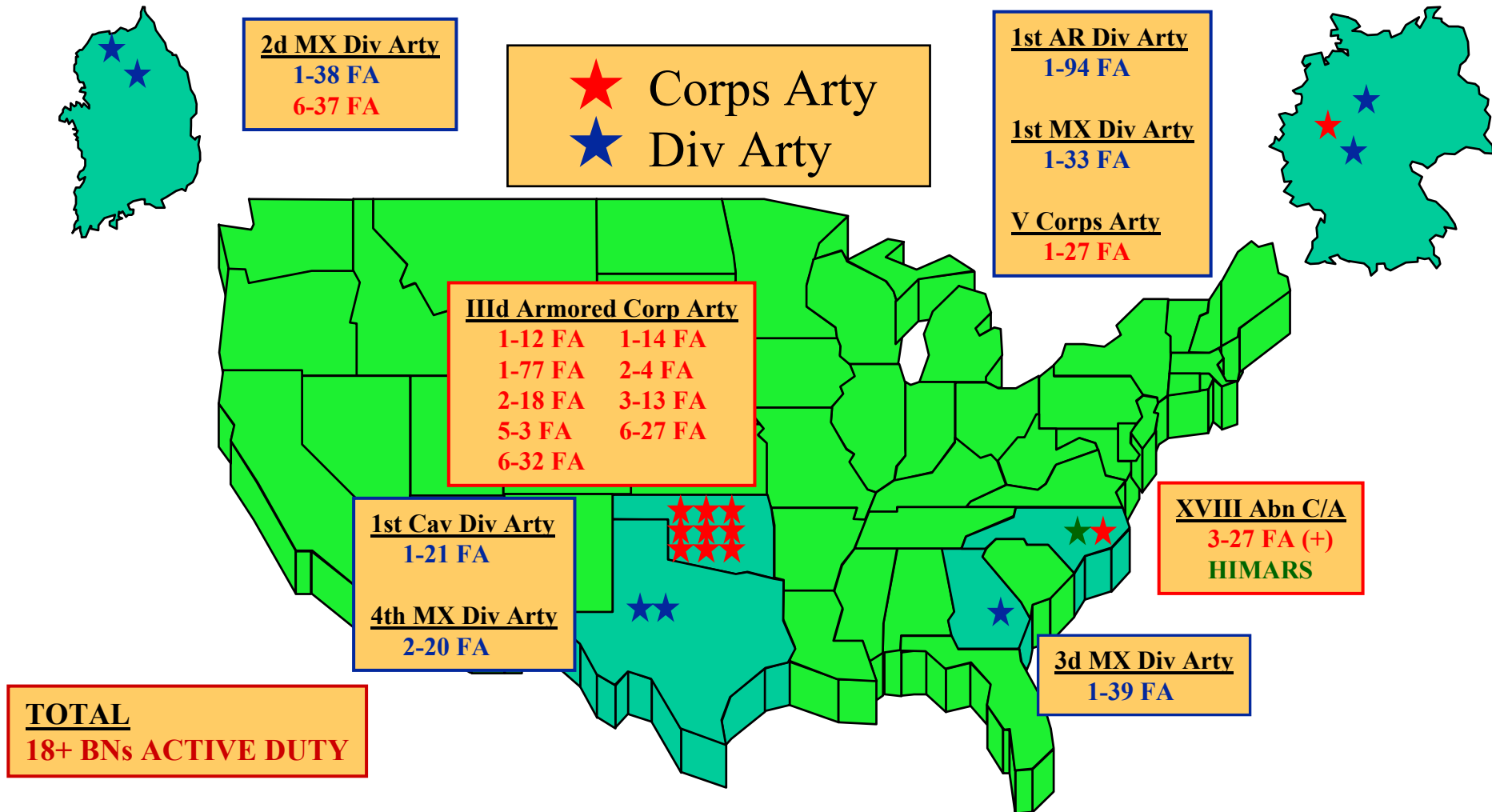
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# ***Learning Activities***

- Identify the Organization of MLRS Battalions
- Acquire knowledge of MLRS Weapon System Components
- Identify MLRS Family of Munitions
- Identify ATACMS Family of Munitions

# *MLRS Battalion Organization*

# Active Component



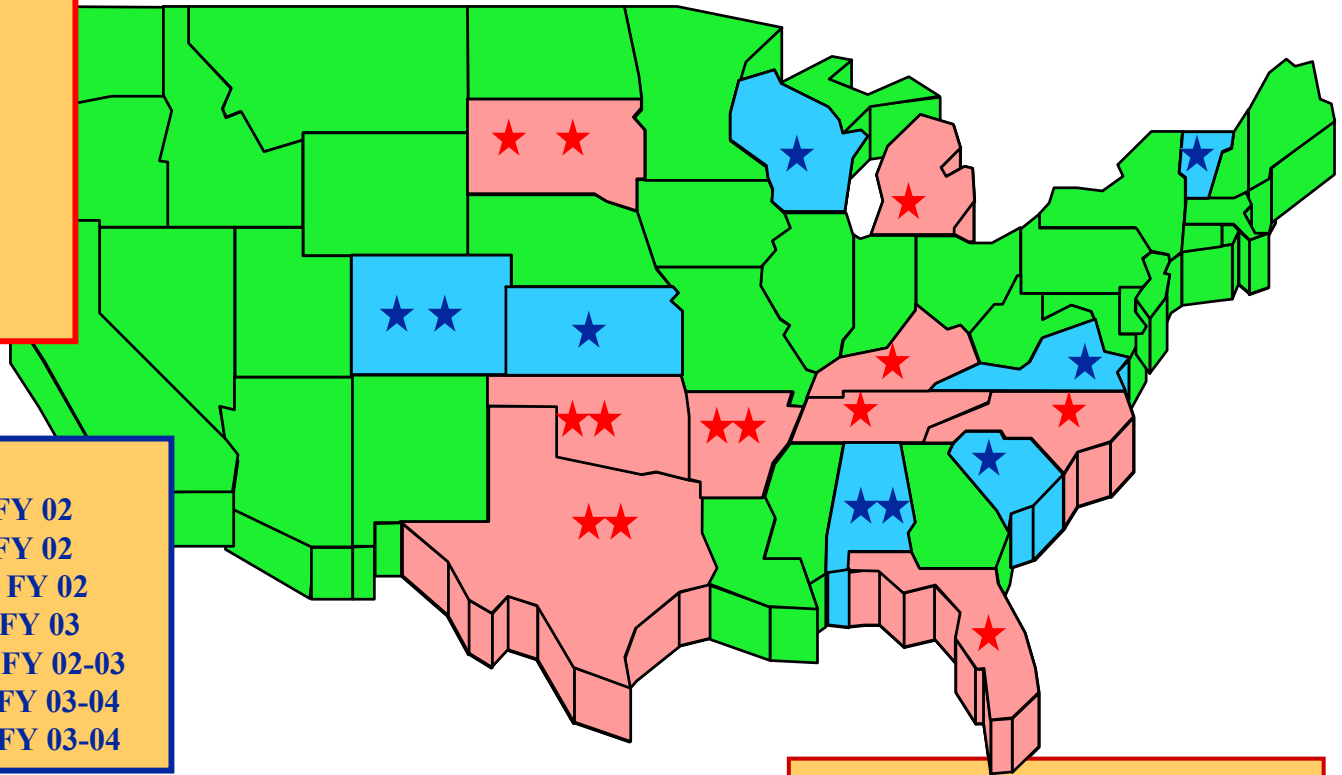
# National Guard Component

## FIELDER ARNG

1-158 FA	OKLAHOMA
B/2-131 FA	TEXAS
1-171 FA	OKLAHOMA
1-182 FA	MICHIGAN
1-181 FA	TENNESSEE
1-623 FA	KENTUCKY
3-116 FA	FLORIDA
2-130 FA	KANSAS
3-178 FA	S. CAROLINA
1-142 FA	ARKANSAS
1-147 FA	S. DAKOTA
2-147 FA	S. DAKOTA
5-113 FA	N. CAROLINA
2-142 FA	ARKANSAS
C/2-131 FA	TEXAS

## PROPOSED ARNG

3-117 FA	ALABAMA	FY 02
2-117 FA	ALABAMA	FY 02
2-157 FA	COLORADO	FY 02
1-157 FA	COLORADO	FY 03
1-86 FA	VERMONT	FY 02-03
1-161 FA	KANSAS	FY 03-04
1-111 FA	VIRGINIA	FY 03-04

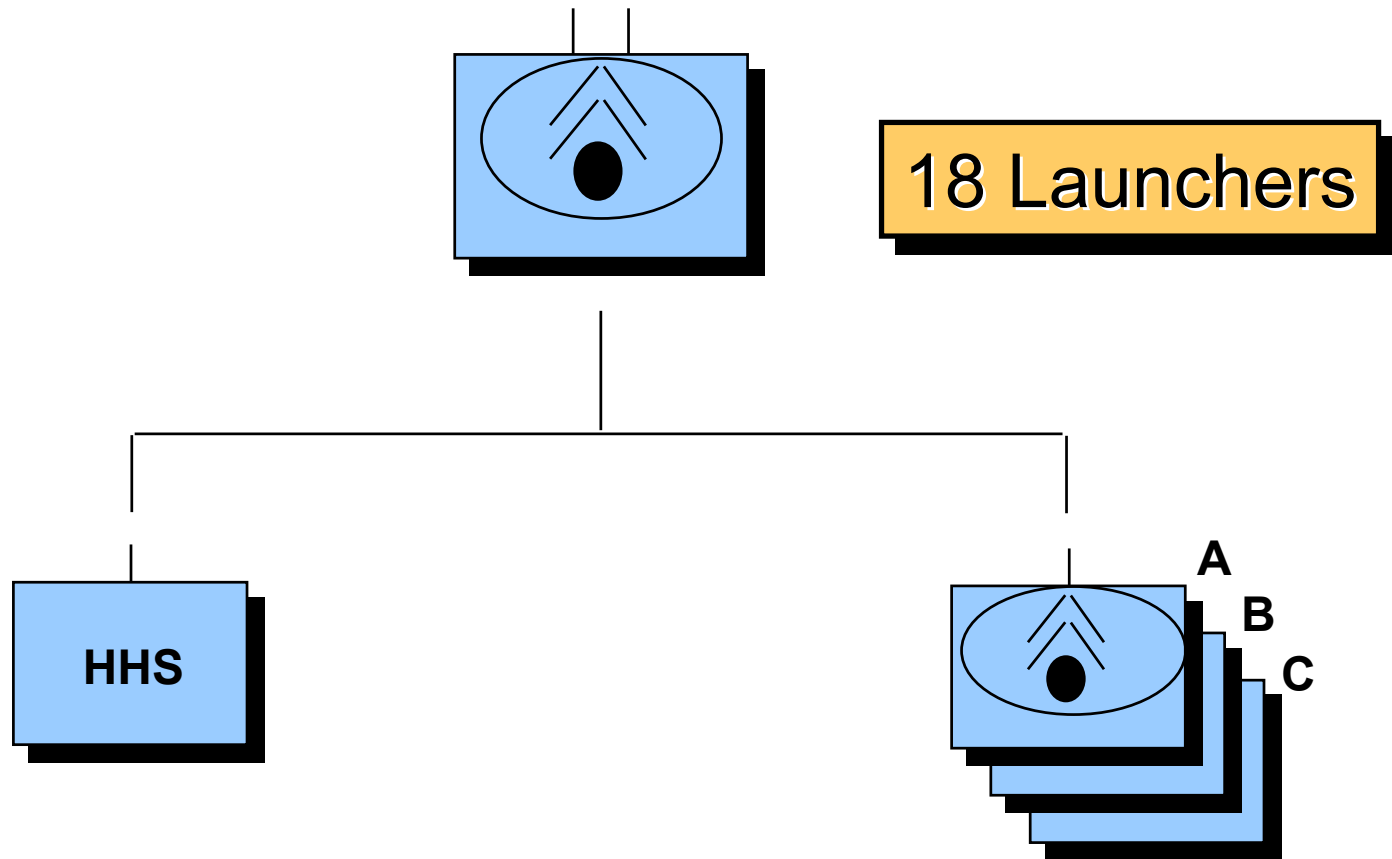


## TOTAL

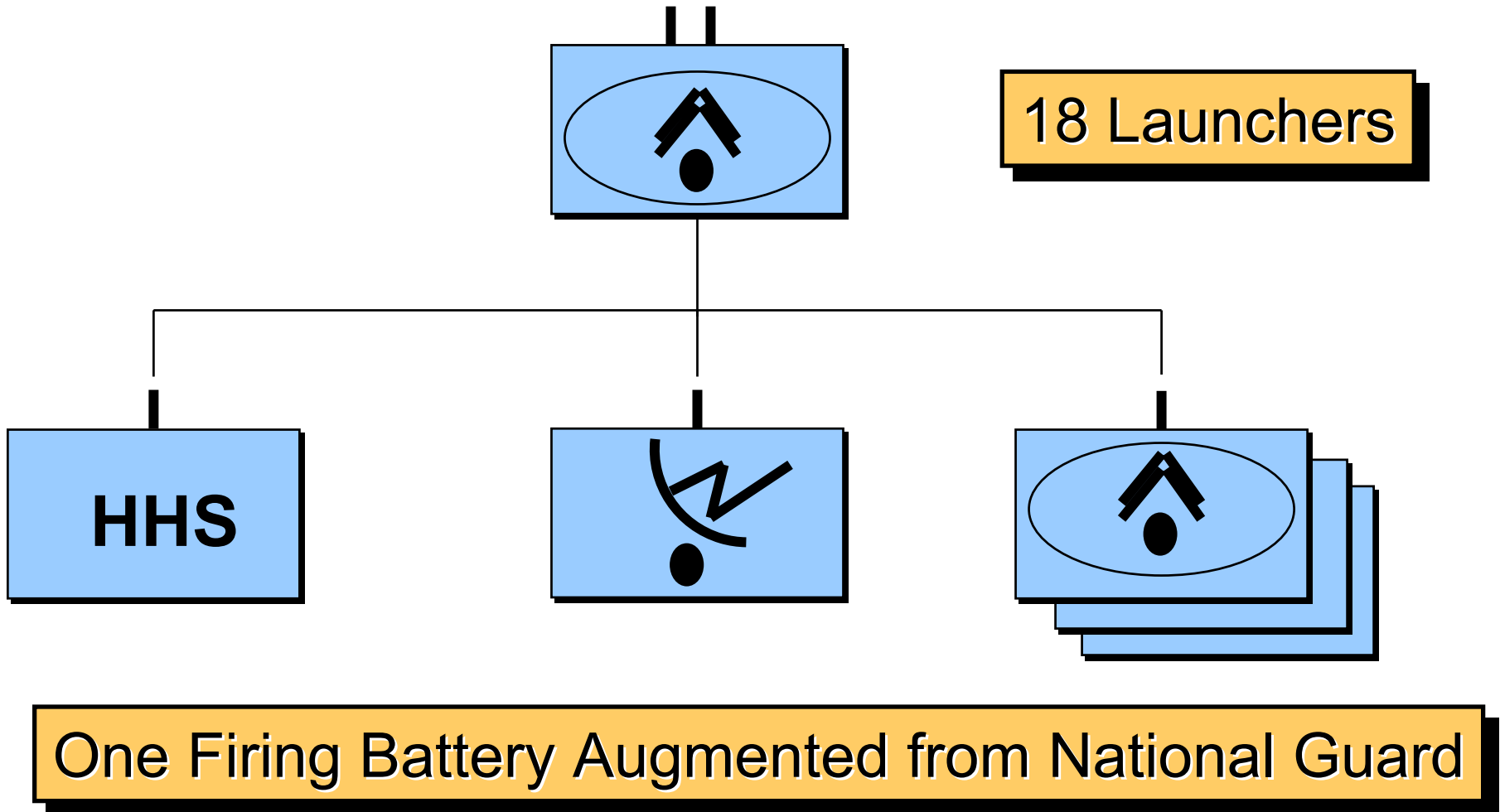
18+ BNs ACTIVE DUTY

21+ BNs NATIONAL GUARD

# ***Corps MLRS Battalion***



# ***Divisional MLRS Battalion***



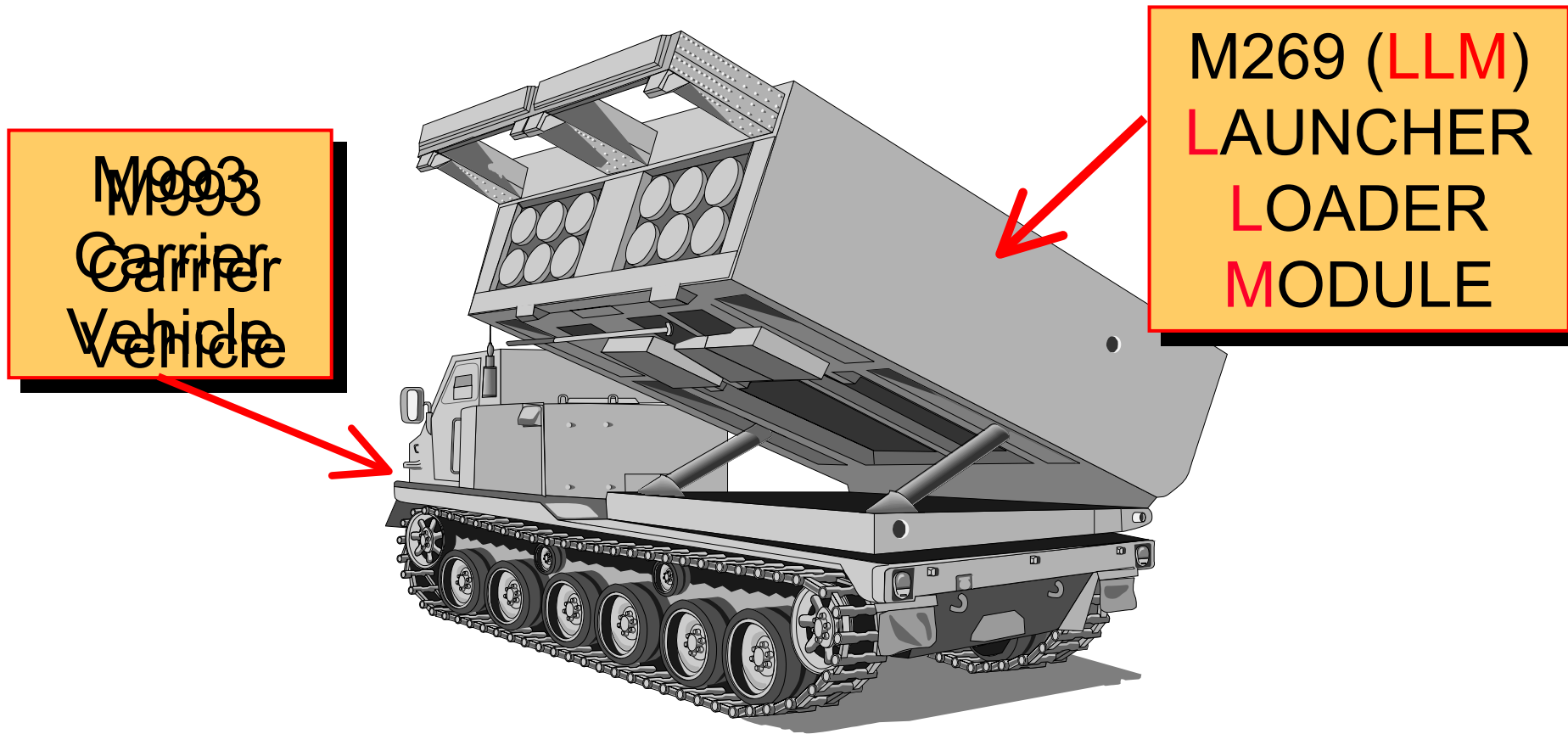
# *Weapon System Components*



# ***Weapon System Components***

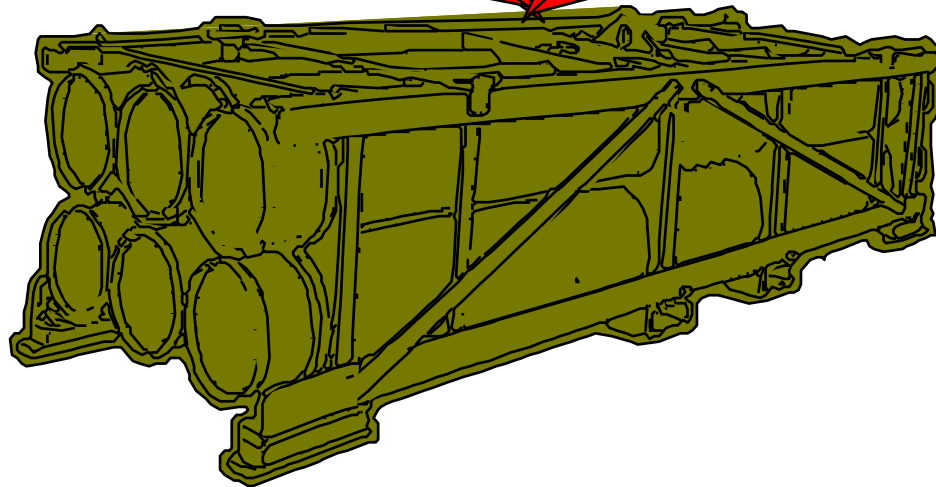
- Self Propelled Launcher Loader
- Launch Pod Containers
- Guided Missile Launch Assembly
- Heavy Expanded Mobility Tactical Truck
- Heavy Expanded Mobility Ammunition Trailer
- C<sup>3</sup> Systems

# ***M270 Self-Propelled Launcher Loader (SPLL)***



**LPC**  
**Launch POD Container**  
**6 Rockets/LPC**

**GMLA**  
**Guided Missile**  
**Launch Assembly**  
**1 Missile/GMLA**



# ***Launch Pods (LPC/GMLA)***

- Common electrical connectors
- Handling, transport and loading fixtures similar
- Visually similar in excess of 100 meters
- Different center of gravity

# ***Launcher Firing Capability***

## ROCKETS

- Fire 12 rockets in 60 seconds.
- Interval between 5 and 99 seconds.
- Aimed at single or multiple aimpoints.

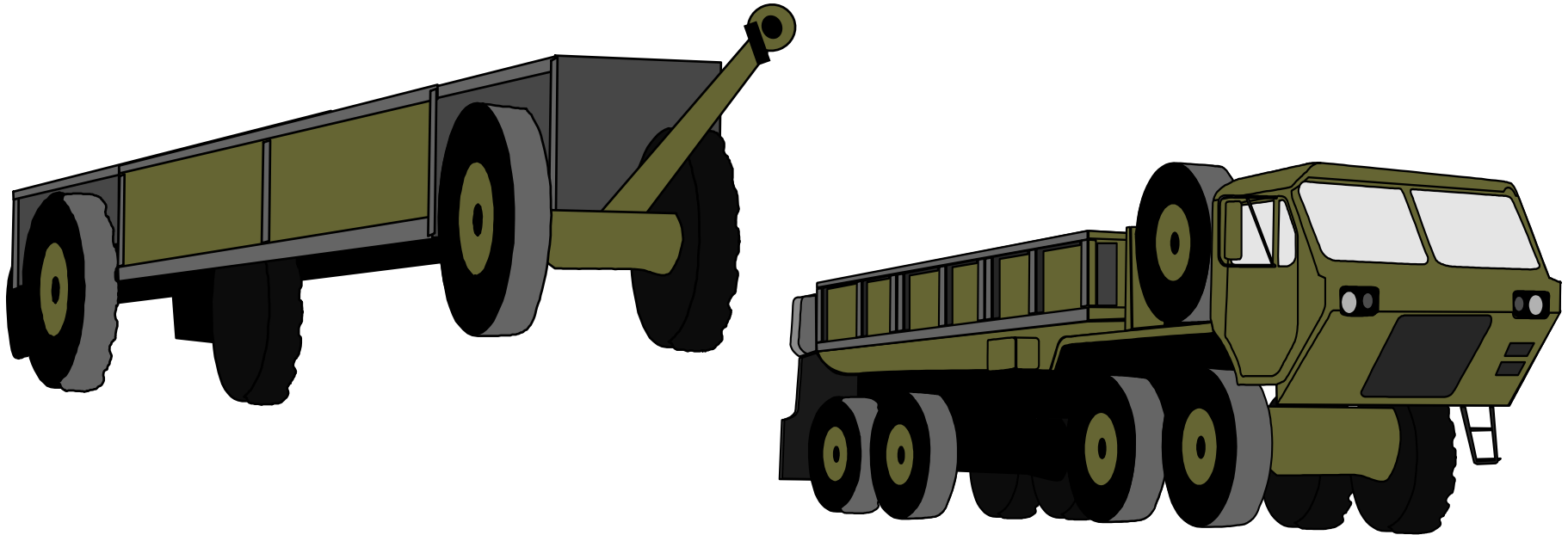
## MISSILES

- Fire 2 missiles in 20 seconds.
- Interval between 5 and 99 seconds.
- Aimed at 1 or 2 separate aimpoints.

# ***HEMTT / HEMAT***

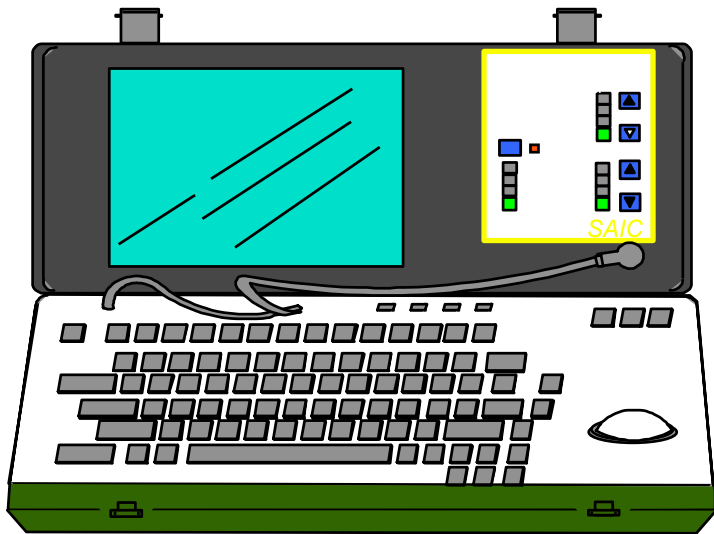
M985 Heavy Expanded Mobility Tactical Truck

M989A1 Heavy Expanded Mobility Ammunition  
Trailer



# *Fire Direction System (FDS)*

**Provides tactical fire  
direction and C<sup>3</sup>at:**



**AN/GYK-37**

**II  
TOC**

**BATTALION**  
C<sup>2</sup> information  
Select platoon to fire

**I  
BOC**

**BATTERY**  
C<sup>2</sup> information  
Select launcher to fire  
Perform as BN

**●●●  
POC**

**PLATOON**  
Monitor C<sup>2</sup> information  
Relay fire mission data  
Detachment C<sup>2</sup>  
Perform as BTRY

# ***FDS C<sup>3</sup> Capabilities***

Advanced FA  
Tactical Data  
Sys. (AFATDS)

Firefinder Radar  
(Q36) & (Q37)

All Source  
Analysis  
System(ASAS)

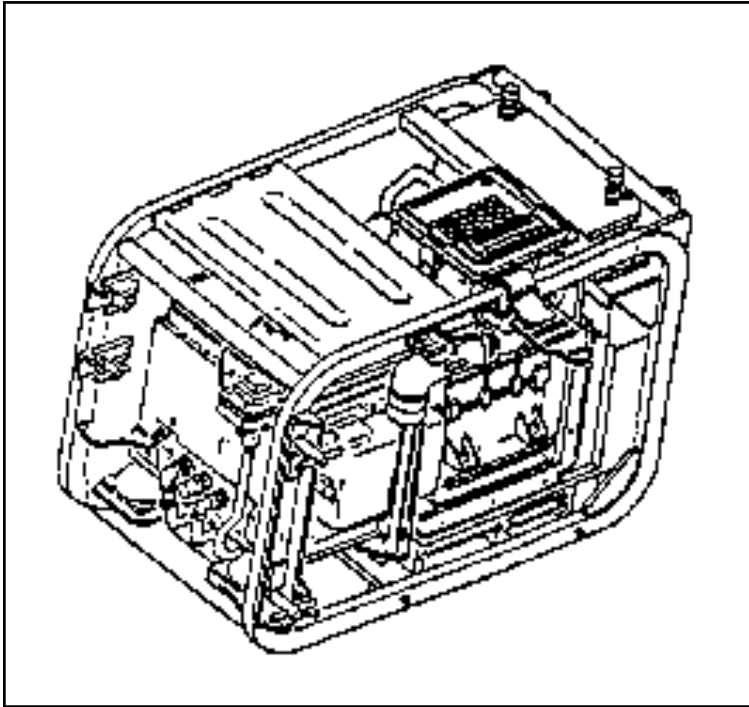
Airborne Target  
Hand over System  
(ATHS)

Marine Corps  
Fire Support  
System (MCFSS)

Ground Station  
Module (GSM)



# ***Position Azimuth Determining System (PADS)***



- 3 PADS per Battalion.
- Determines location, azimuth and altitude.
- Primary means for determining position control.

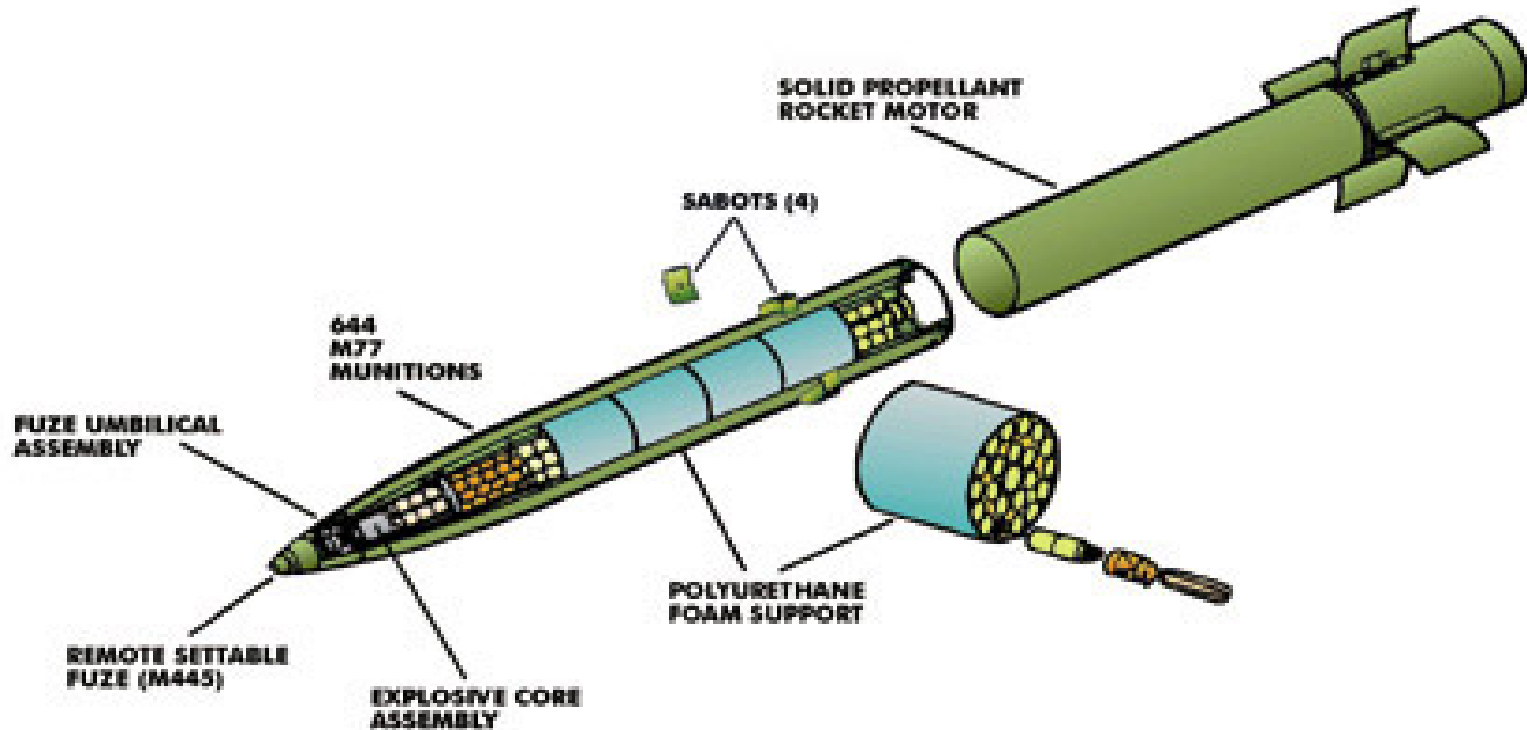
# ***Precision Lightweight GPS Receiver (PLGR)***



- One PLGR per launcher section.
- Secondary means for establishing position control.
- Only useful for position control when it provides a figure of merit (FOM) of 1.

*MLRS FAMILY  
OF  
MUNITIONS  
(MFOM)*

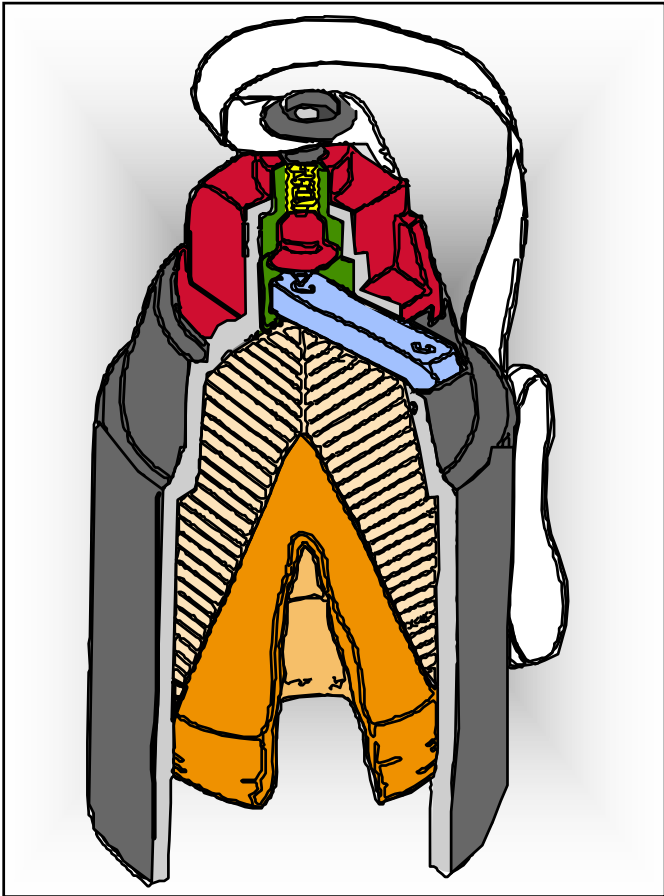
# M26 Rocket



Tube launched,  
spin stabilized,  
free-flight rocket

Range:	10 - 32 km
Submunitions:	644
Accuracy:	10 mils

# ***M77 DPICM Submunition***

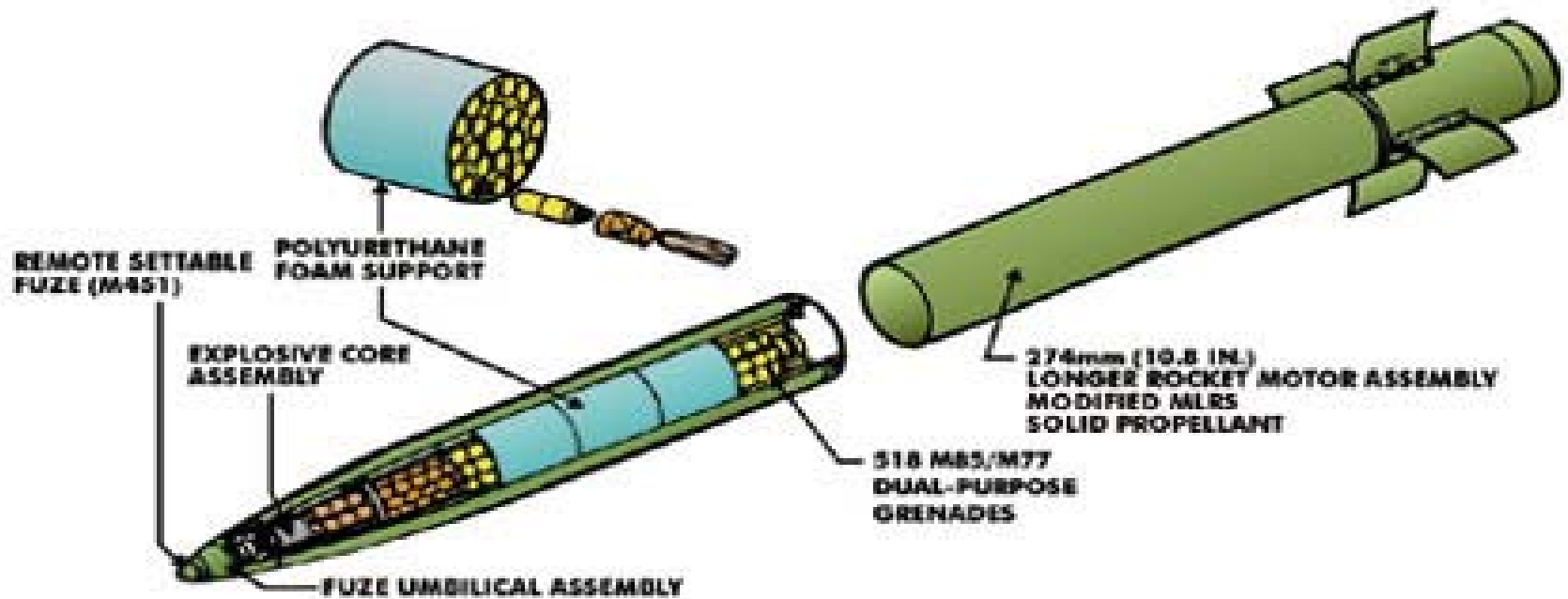


- Point detonating shaped charge.
- Penetrates up to 4 inches of armor.
- Fragmentation radius of 4 meters.
- Effective against soft and lightly armored targets.

# ***M77 Dual Purpose Improved Conventional Munition (DPICM)***

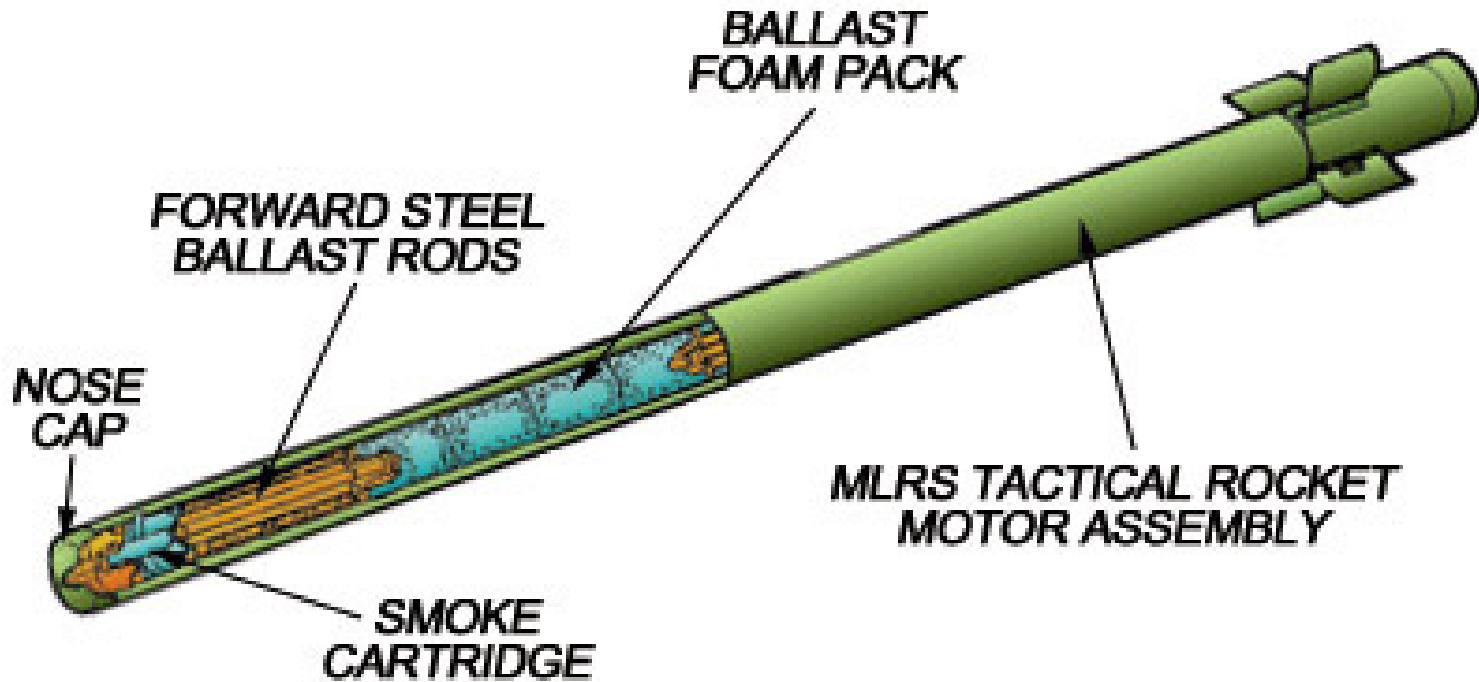
	<u>Rockets (M26)</u>	<u>Submunitions</u>
1 Rocket	1 Rocket	644
1 Launcher	12 Rockets	7,728
1 Platoon	36 Rockets	23,184
1 Battery	72 Rockets	46,368

# ***M26A2 Extended Range Rocket***



518 M77 Submunitions, max. range 45 km,  
improved dud rate.

# ***M28A1 Reduced Range Practice Rocket***



Tube launched,  
fin stabilized,  
free-flight rocket

Range:	8 - 15 km
Submunitions:	None
Accuracy:	10 mils



# ***MLRS (M26) vs 155mm Firepower Comparison***

## MLRS (3x6)

1 ROCKET

1 LAUNCHER

1 PLATOON

1 BATTERY

## Cannon (3x6)

BTRY 1(+) or 8 RDS

BN 4(+) or 88 RDS

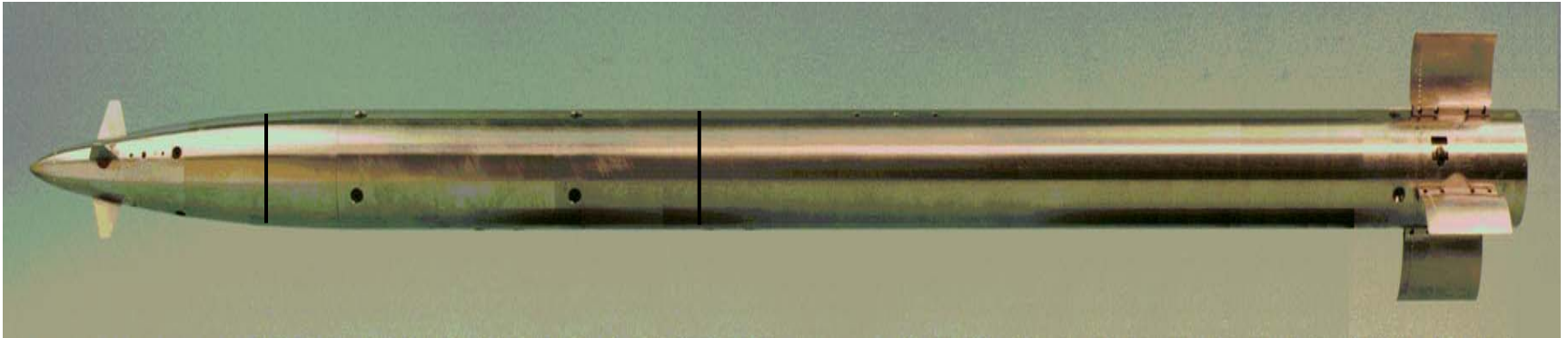
BN 14(+) or 264 RDS

BN 29(+) or 527 RDS

# ***M26 vs M483A1 Ammunition Comparison***

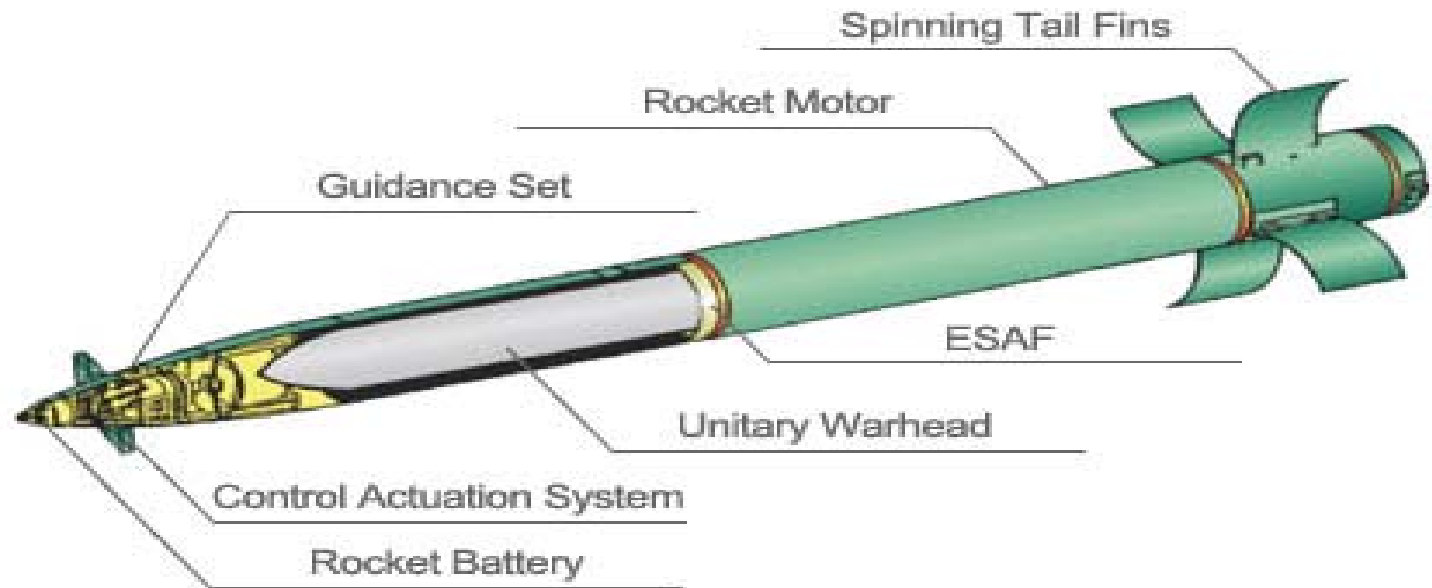
	M26 Rocket	M483A1
Min. Range	10 km	500 m
Max. Range	32 km	17.5 km
Submunitions	644 (M77)	88 (M42&M46)
Accuracy	10 mils	3 mils

# ***Guided MLRS Rocket (GMLRS) XM30***



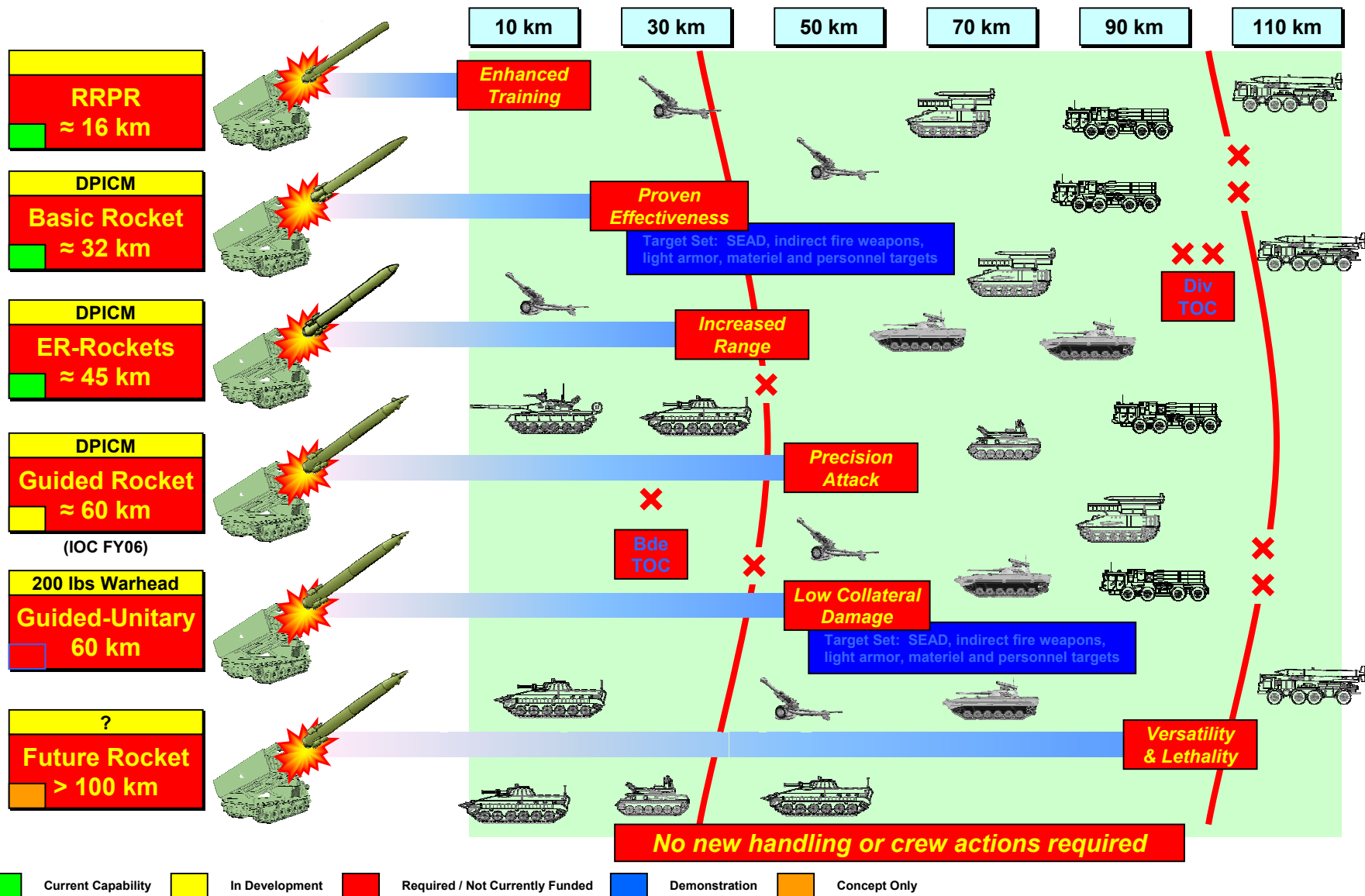
- Adds GPS guidance system and increases max. range to approx. 60km. For use with IPDS/A1/HIMARS launchers.
- 404 M77 Submunitions
- 2-3 mil error across entire range.

# ***Guided Unitary Rocket***



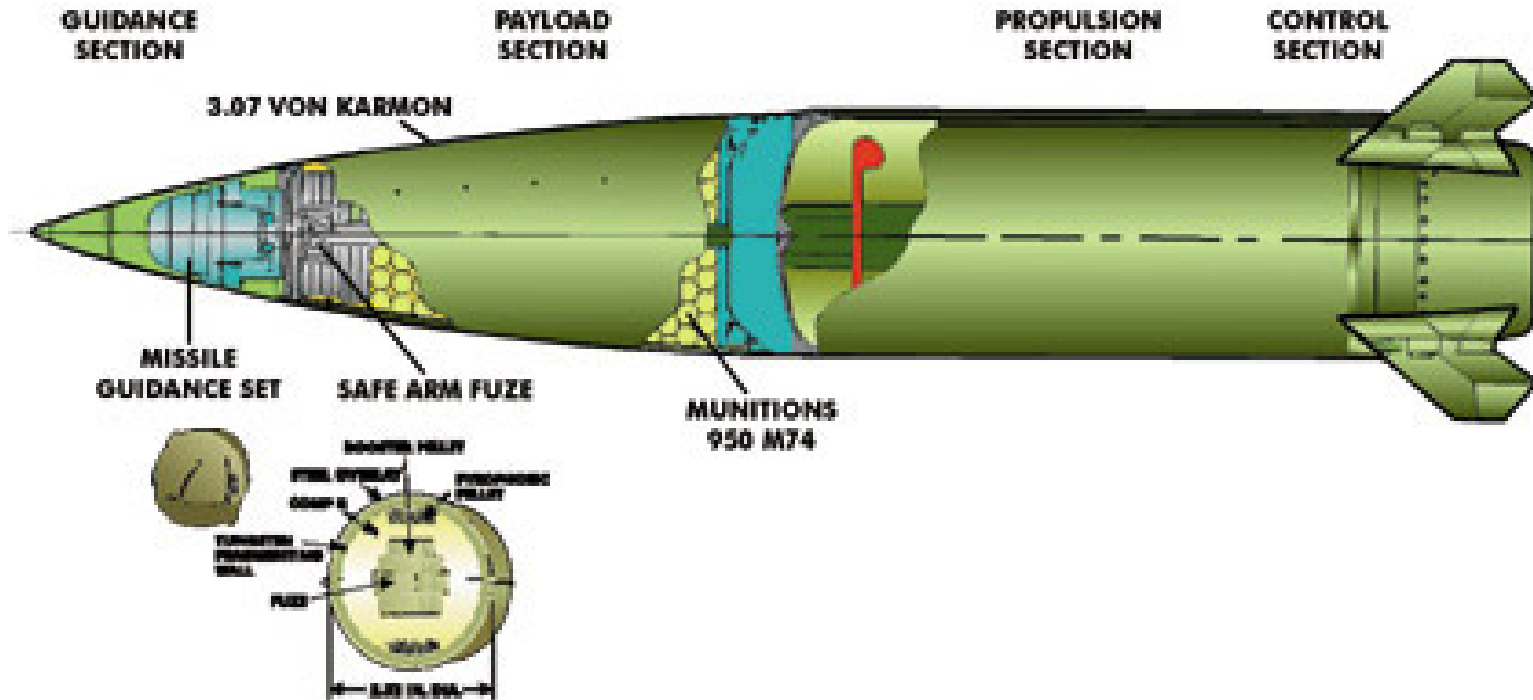
- Integrates approximately 200 pound Unitary Warhead into the GMLRS
- Low cost/risk program to greatly reduce collateral damage
- One round, one kill capability

# MFOM Review



*ATACMS*  
*FAMILY OF*  
*MUNITIONS*  
*(AFOM)*

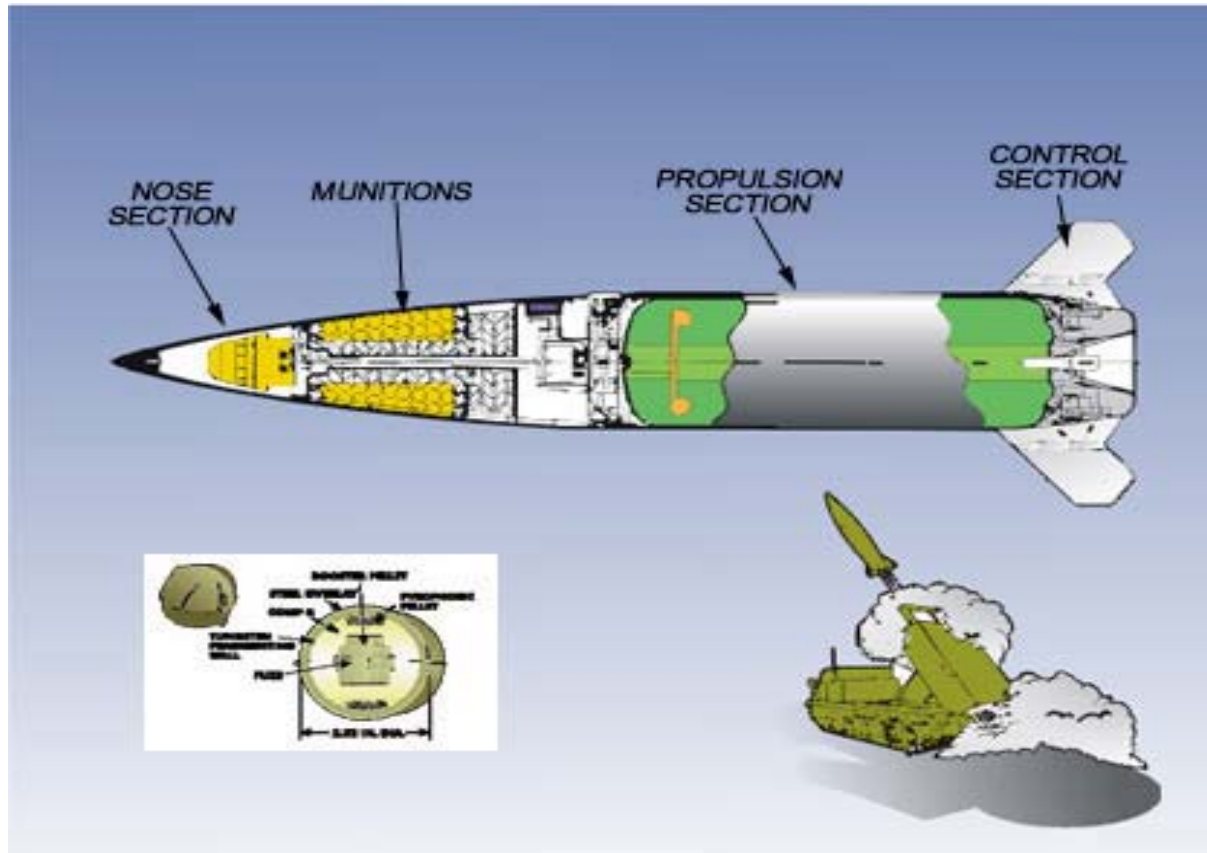
# ATACMS Block I



Range: 25-165 km  
Submunitions: 950

Tube launched, fin stabilized, inertially guided missile.

# ATACMS Block IA



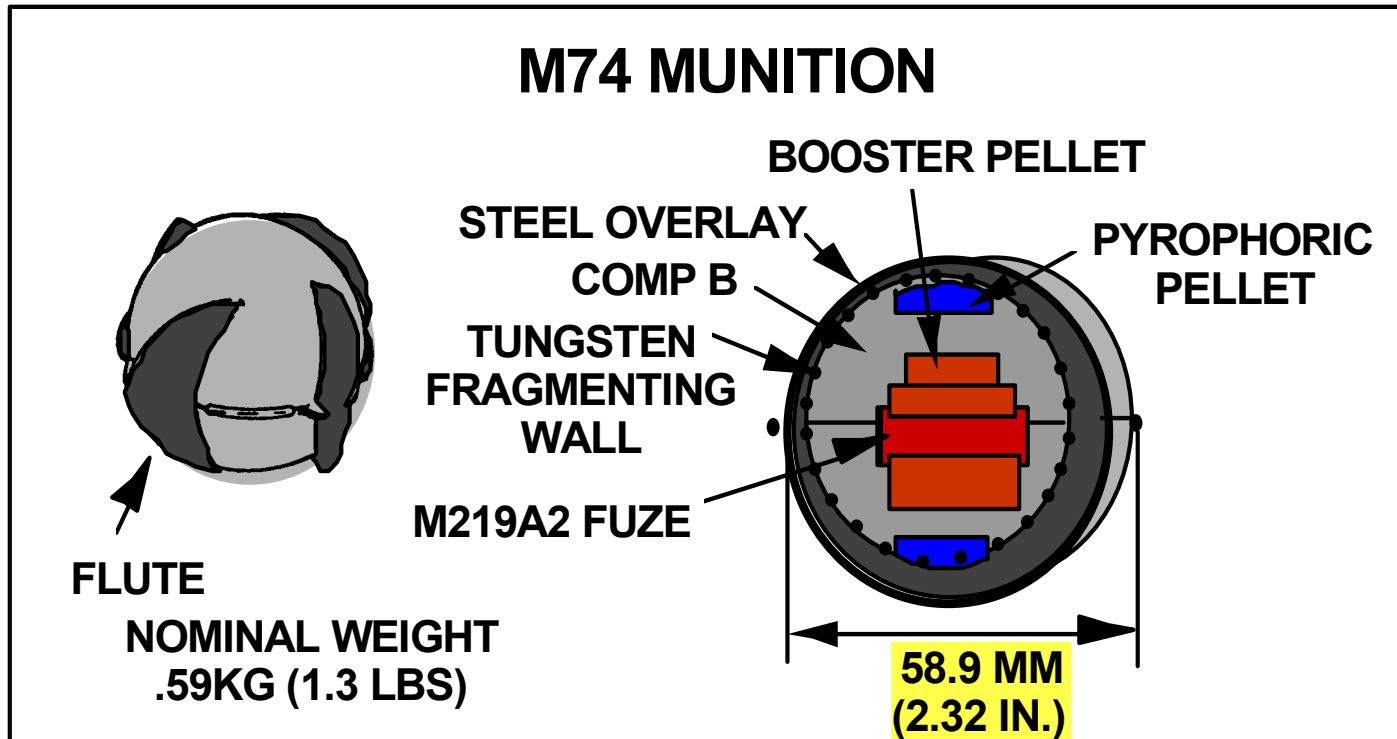
Range: 70-300km

Submunitions: 300

Tube launched, fin stabilized, GPS guided missile.

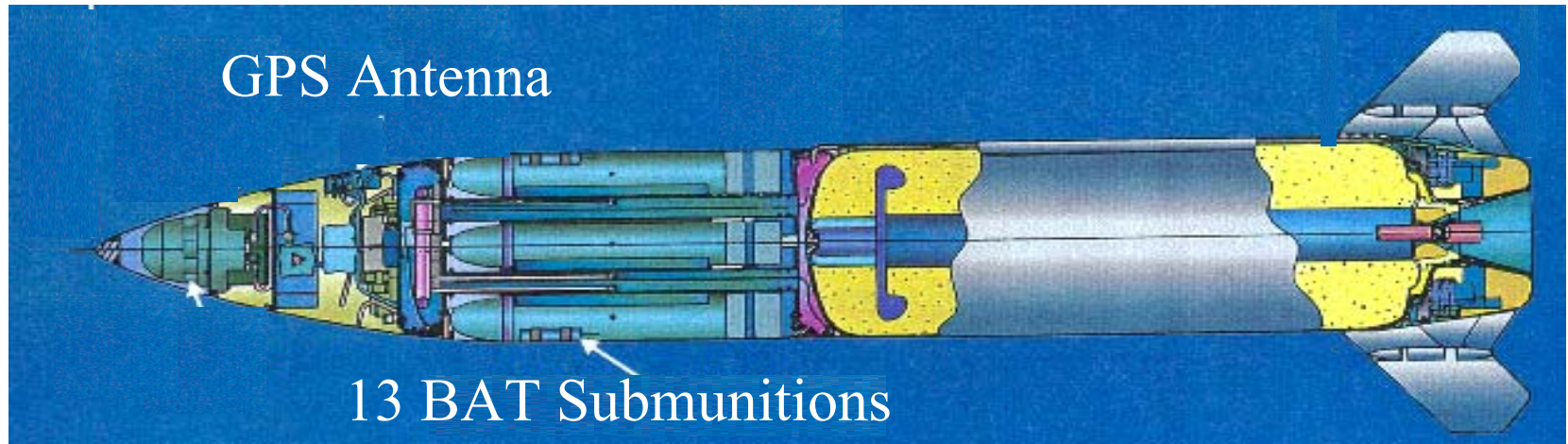


# ***M74 Submunition***



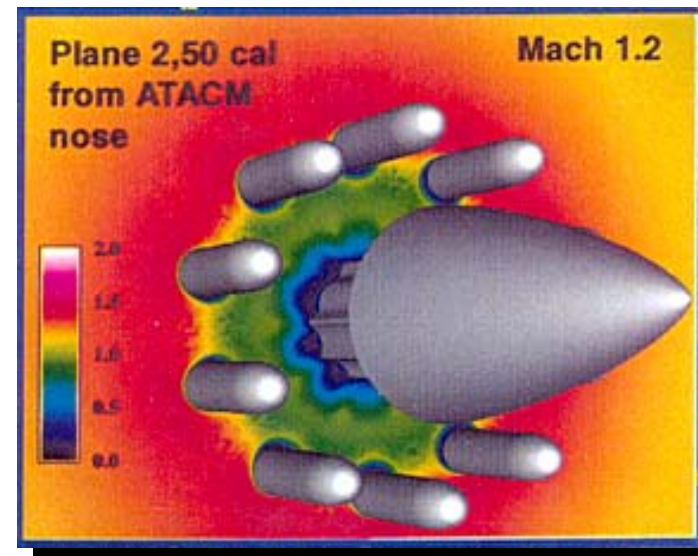
- Fragmentation radius of 15 meters.
- Effective against soft vehicle and personnel targets.
- Will not penetrate armor.

# *The ATACMS Missile Block II*



BLOCK II (FY01)

35-140km range, 13 BAT submunitions



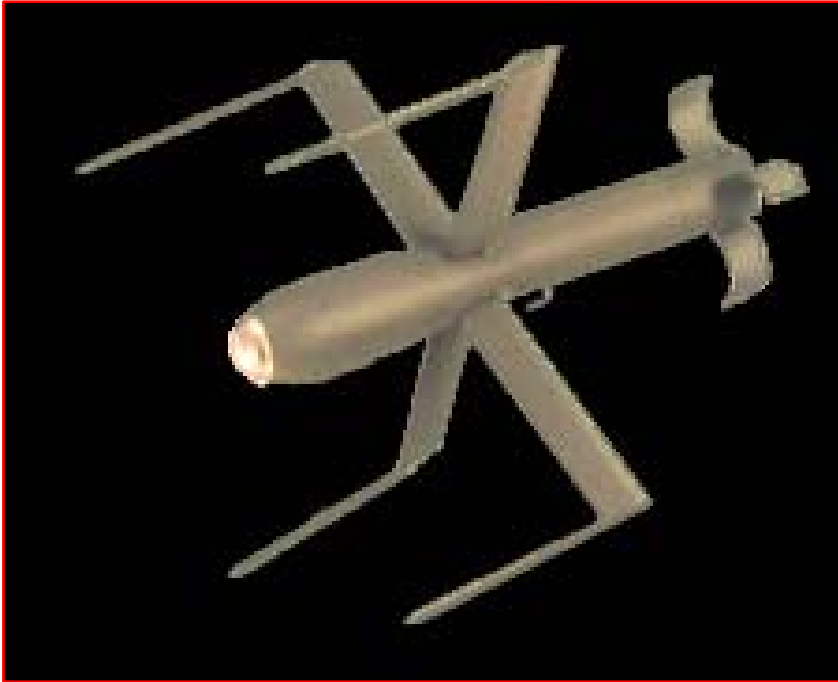
# ***MLRS Introduction***

## ***BAT Video***



No Picture

# ***BAT***



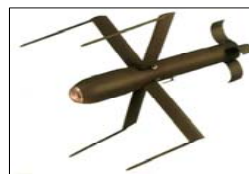
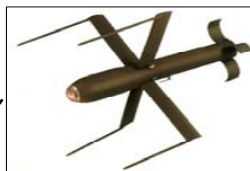
- Brilliant Anti-Armor Submunition.
- Acoustic & IR. sensor.
- Autonomously seeks & kills deep moving armor targets.
- ATACMS block II missile in limited production

# ***BAT Attack Profile***

***Each BAT Divides the Target into 26 Sectors***

**Direct Attack**

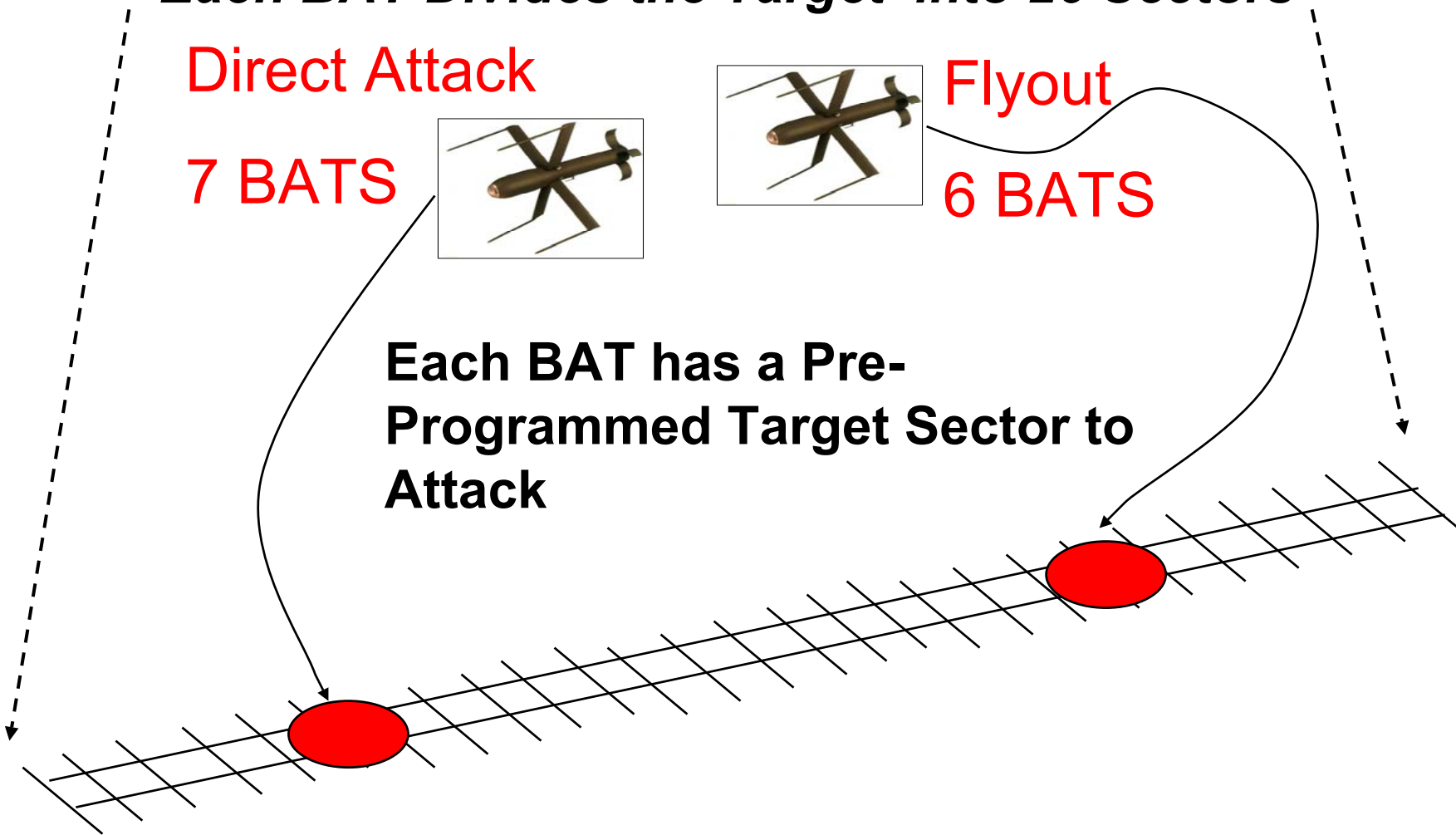
**7 BATS**

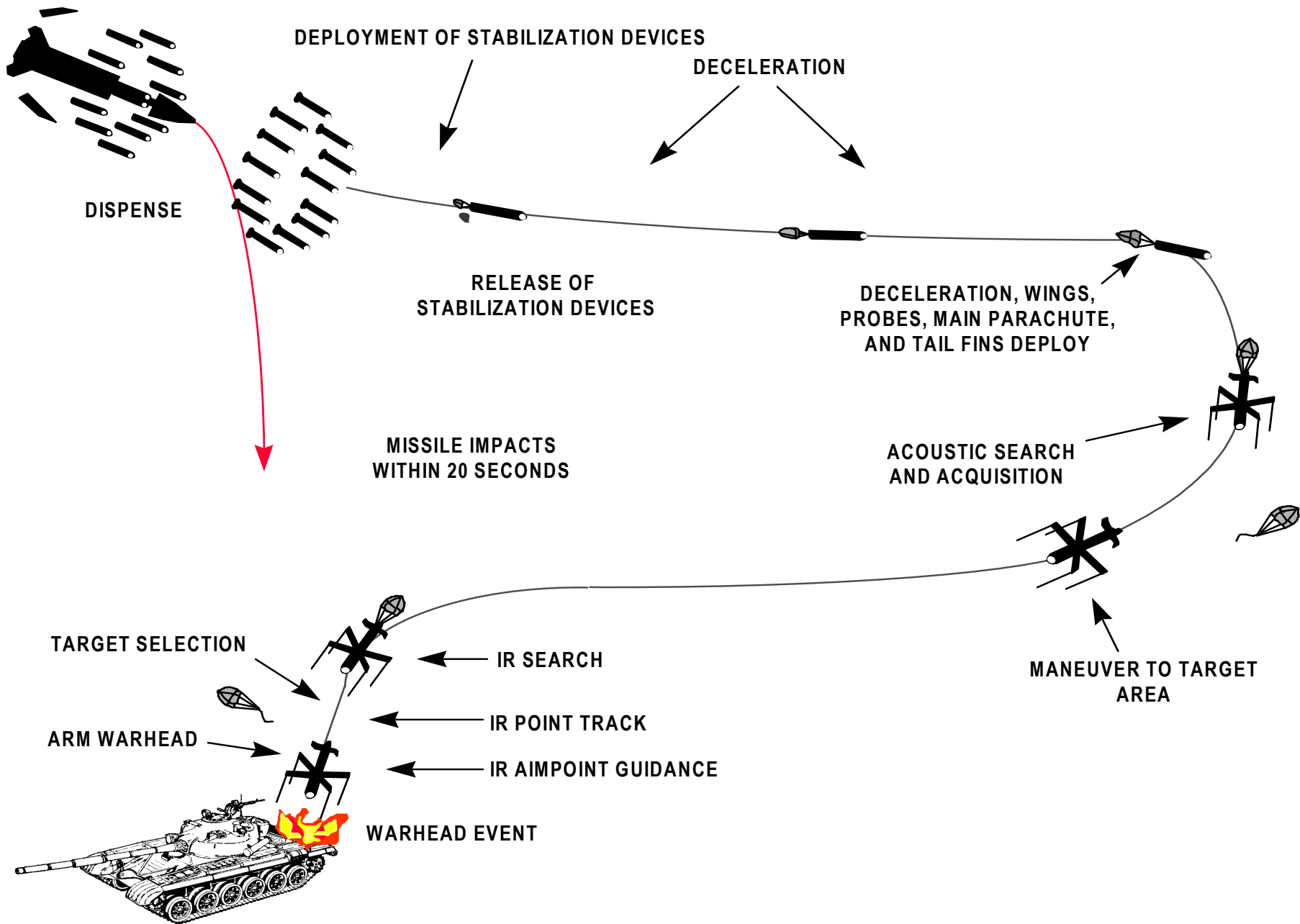


**Flyout**

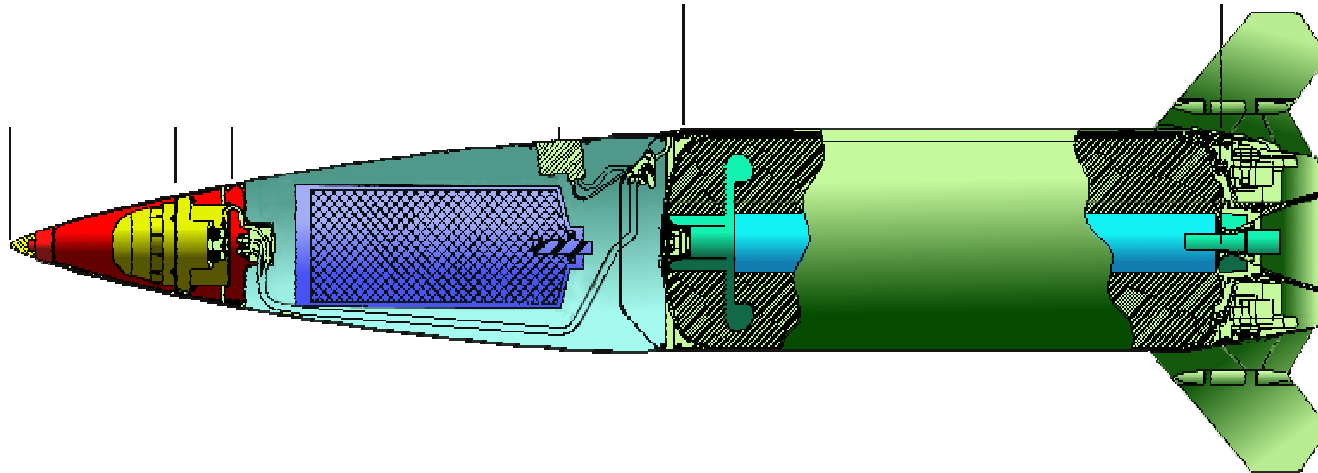
**6 BATS**

**Each BAT has a Pre-Programmed Target Sector to Attack**





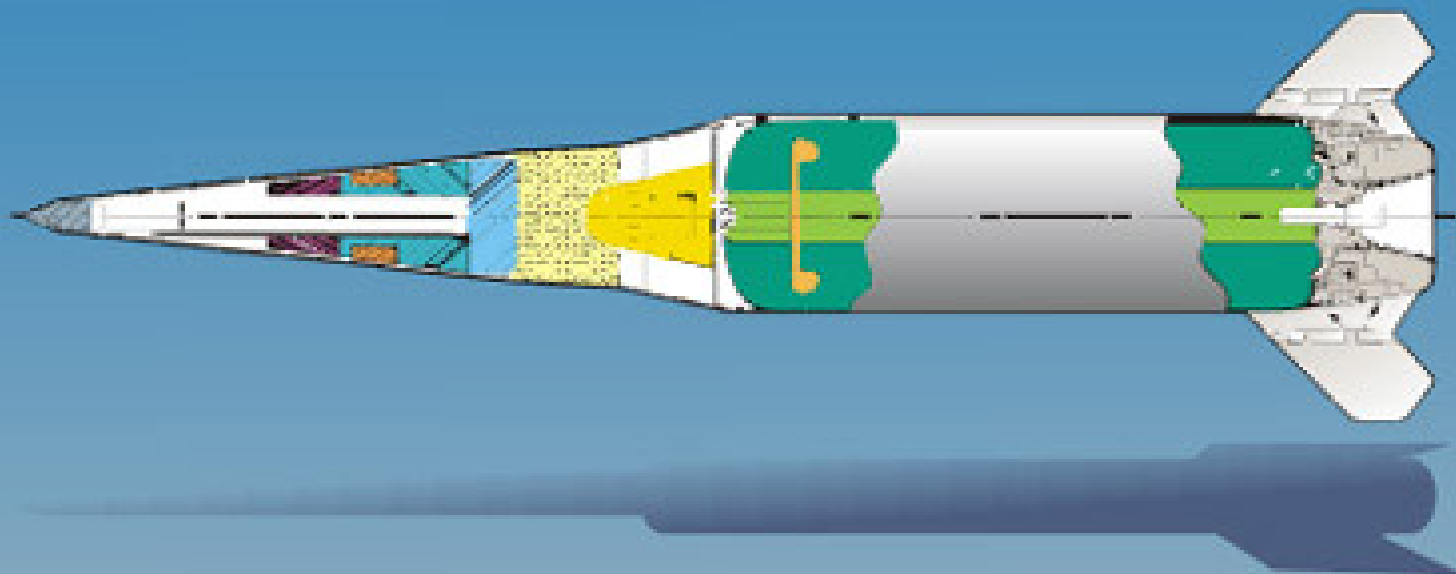
# ***Quick Reaction Unitary***



## ***Quick Reaction Program TACMS Unitary:***

- **Objective Target Sets:** Includes buildings, POL sites, power plants, and other targets where collateral damage is unacceptable
- **Integrate 500 lb WDU 18/B Warhead on 43 Block IA's**
- **Max Range 280 km**
- **Full AFATDS Integration**

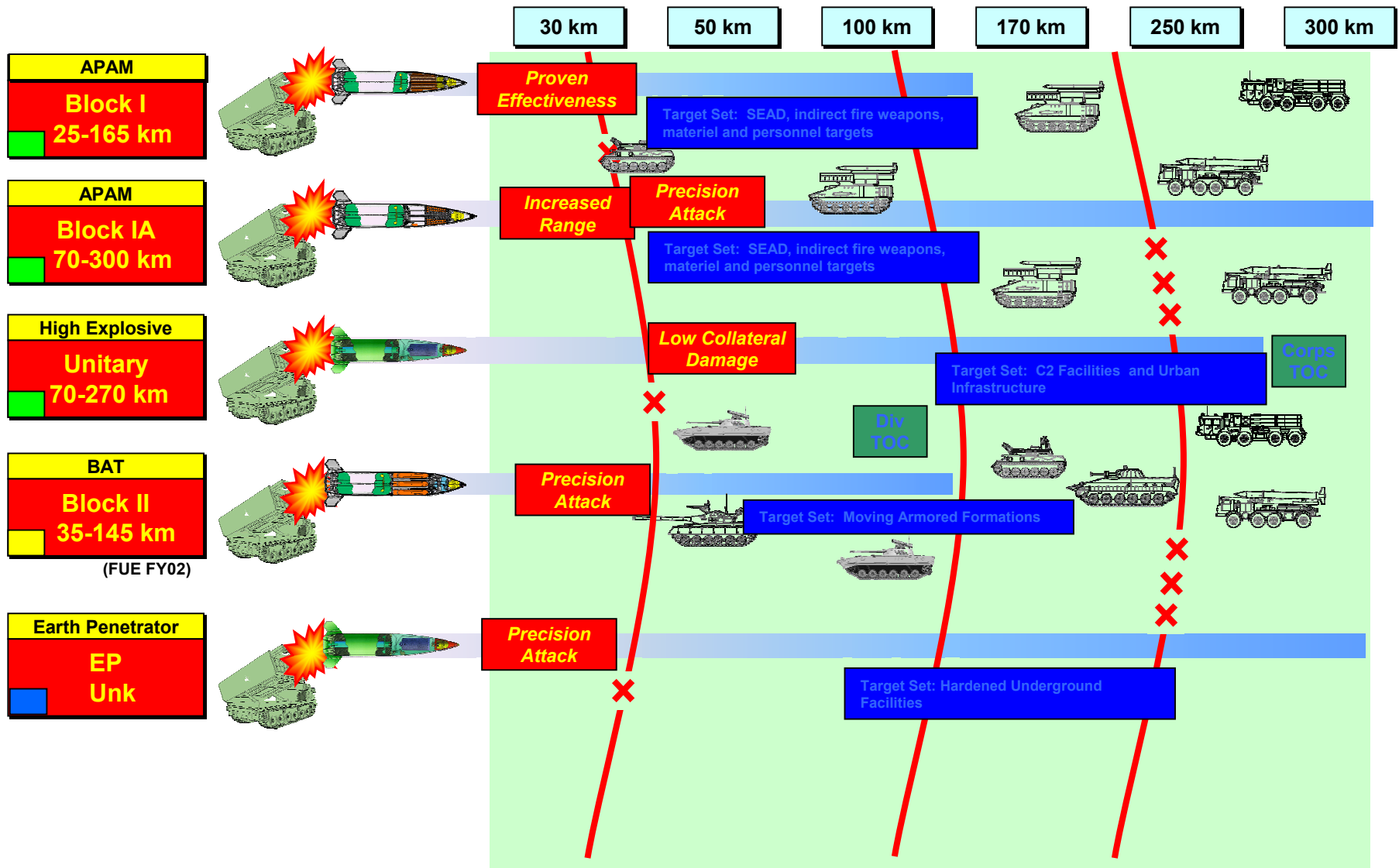
## **TACTICAL MISSILE SYSTEM PENETRATOR**



140-220 km range



# AFOM Review



Current Capability
  In Development
  Required / Not Currently Funded
  Demonstration
  Concept Only

# ***Summary***

- Location and Organization of MLRS Battalions
- MLRS Weapon System Components
- MLRS Family of Munitions
- ATACMS Family of Munitions

# *Field Artillery Officer Basic Course*

## *Support with MLRS Fires*

# The Mission of the Field Artillery is to...



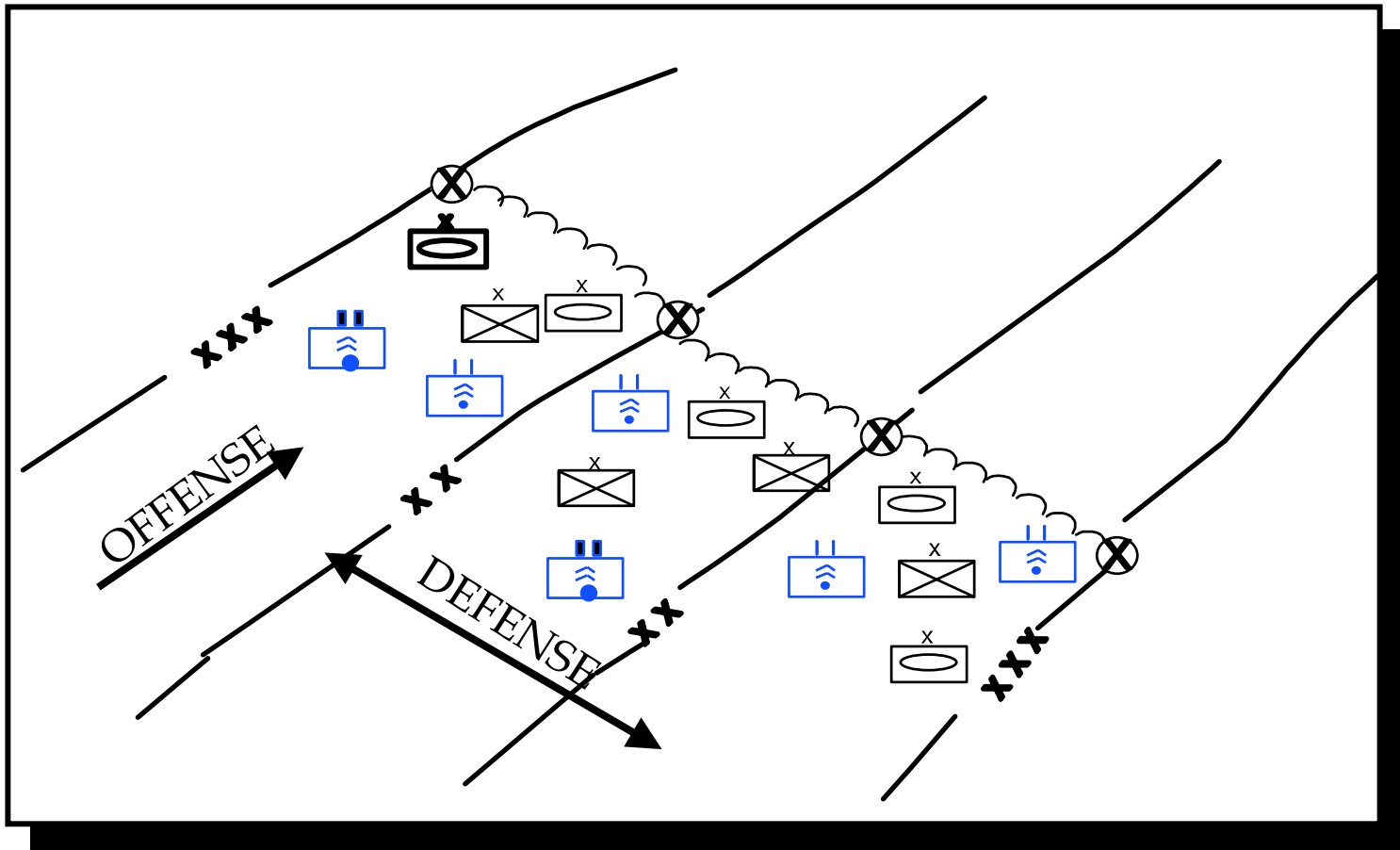
the enemy by cannon, **ROCKET** and **MISSILE** fires  
and to help integrate fire support assets into  
combined arms operations.

# ***Learning Activities***

- Identify MLRS Employment Considerations
- Identify the Tactical Missions associated with MLRS
- Identify the Fire Direction Center responsibilities
- Identify Methods to Control MLRS Munitions
- Identify the Capabilities and Limitations of MLRS units
- Identify MLRS Special Tactics

# *Employment Considerations*

# ***MLRS Employment Concept***



MLRS units are positioned as close to the FLOT as possible, and in some cases beyond the FLOT.

# ***Employment Considerations***

- System Capabilities
  - Range
  - Organizational Structure
- Close Operations
  - Rockets Fired Short of the FSCL
  - Counter fire
  - Raids
  - SEAD (Suppression Enemy Air Defense)
- Deep Operations
  - Missiles Fired Beyond the FSCL
  - ATACMS Block I and IA
  - D<sup>3</sup>A Methodology



# ***Employment Considerations***

- Rear Operations
  - Area fire weapons system
  - Not the weapon system of choice
- Positioning
  - Survivability
    - Limited crew served weapons
  - Enemy target Acquisition
  - Communications

# ***Employment Considerations***

- Planning and Coordination
  - Launcher redundancy
- Fire Support Planning
  - Configuration Time
  - Reaction Time
  - Launcher Response Time
  - Munitions Load

# *Tactical Missions*

# ***Command Relationship***

- OPTION 1 - Corps retains direct control of the MLRS Battalion (Not Common)
- OPTION 2 - Corps attaches MLRS battalion to an FA Brigade (Fort Sill)
- OPTION 3 - Attach the Battalion or Battalion(-) to a Division (Div Batteries/Battalions)

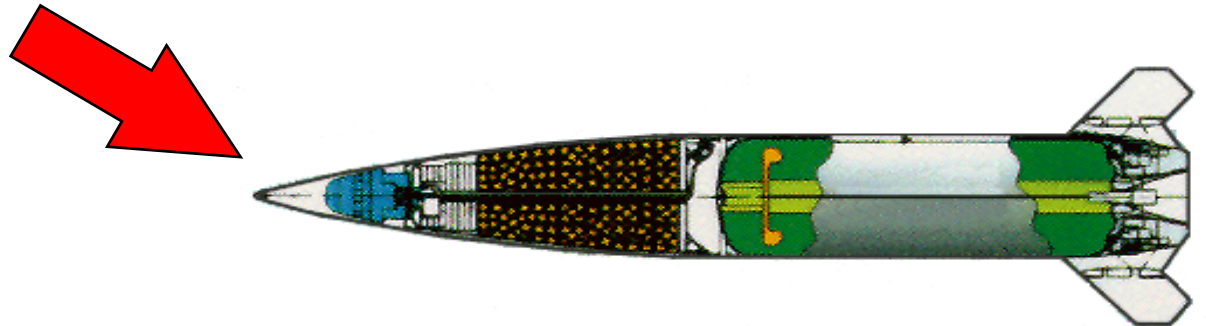
# ***Tactical Missions***

- After establishing a command relationship, the Force Commander assigns the Battalion a tactical mission. They are:
  - General Support (GS)
  - General Support Reinforcing (GSR)
  - Reinforcing (R)
  - Direct Support (DS)

# ***General Support (GS)***

- Provides fires for the entire force.
- Most centralized control.
- Provides force commander with the most responsive fires.

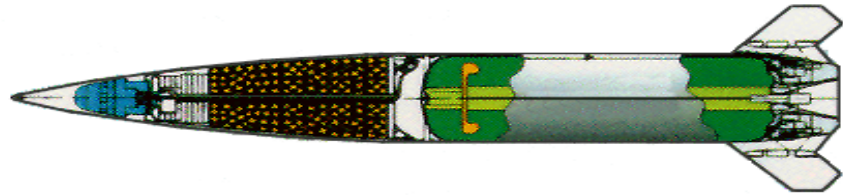
Typically these



# ***General Support Reinforcing (GSR)***

- Controlled by force FA HQs.
- Provides flexibility to meet the needs of various tactical situations.
- Answers Calls for Fire in priority from the Force FA HQ, then the Reinforced unit

Few of these



Many of these



# ***Reinforcing (R)***

- When reinforcing a DS battalion
- MLRS ammunition expenditure may exceed re-supply capability.
- Must provide Liaison section for coordination

Lots of these!!





# ***Direct Support (DS)***

- No fire support element
- Lacks diversity of ammunition
- Area weapon system (Danger Close 2km)
- MLRS fires less responsive than cannon
- Ammunition re-supply (sustaining fires)

# *FDC Responsibilities*

# ***Battalion FDC***

- Tactically controls fires of the battalion
- NCS for the Fire Direction Net(s)
- Primary link with Force FA HQ
- Receives fire plans from Force FA HQ
  - Checks for FSCM violations
  - Selects platoon to execute fire mission
  - Transmits targets to battery FDCs

# ***Battery FDC***

- Concerned solely with delivery of fires
- Executes fireplans
- Checks for FSCM violations
- Transmits fire mission to launcher
- Maintains status of launchers

# ***Platoon FDC***

- Monitors all traffic between BOC and launchers
- Relays messages and orders
- Maintains ammunition and launcher status
- Be prepared to assume Jump BOC

# *Control of MLRS Munitions*

# ***Control of Munitions***

*(M26/M39)*

 Centralized

 Decentralized

# ***Missiles (Centralized)***

## M39 Army Tactical Missiles (ATACMS)

- Normally fired at targets beyond Division's AO
- Generally fired by corps MLRS BNs
- Controlled by the Corps Artillery



# Centralized Execution

## Suite of Sensors

JSTARS	UAV
Radar	SOF
LRS-D	ELINT

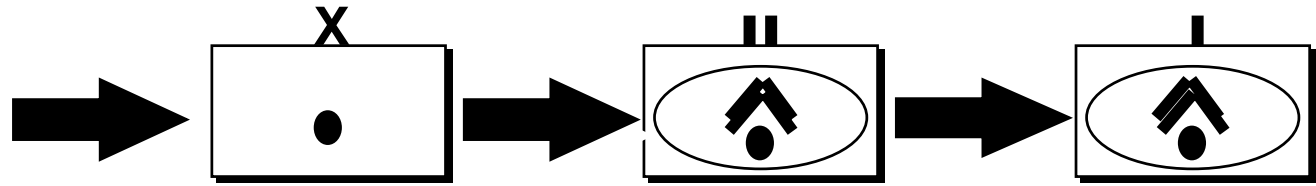
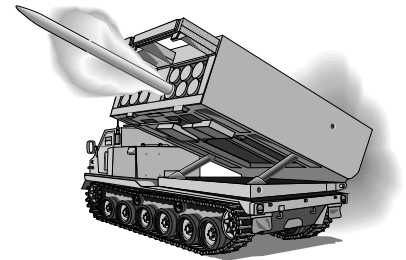
GSM 2



XXX

CTOC

Targeting Team	
AVN	ASOC
ADA	FSE

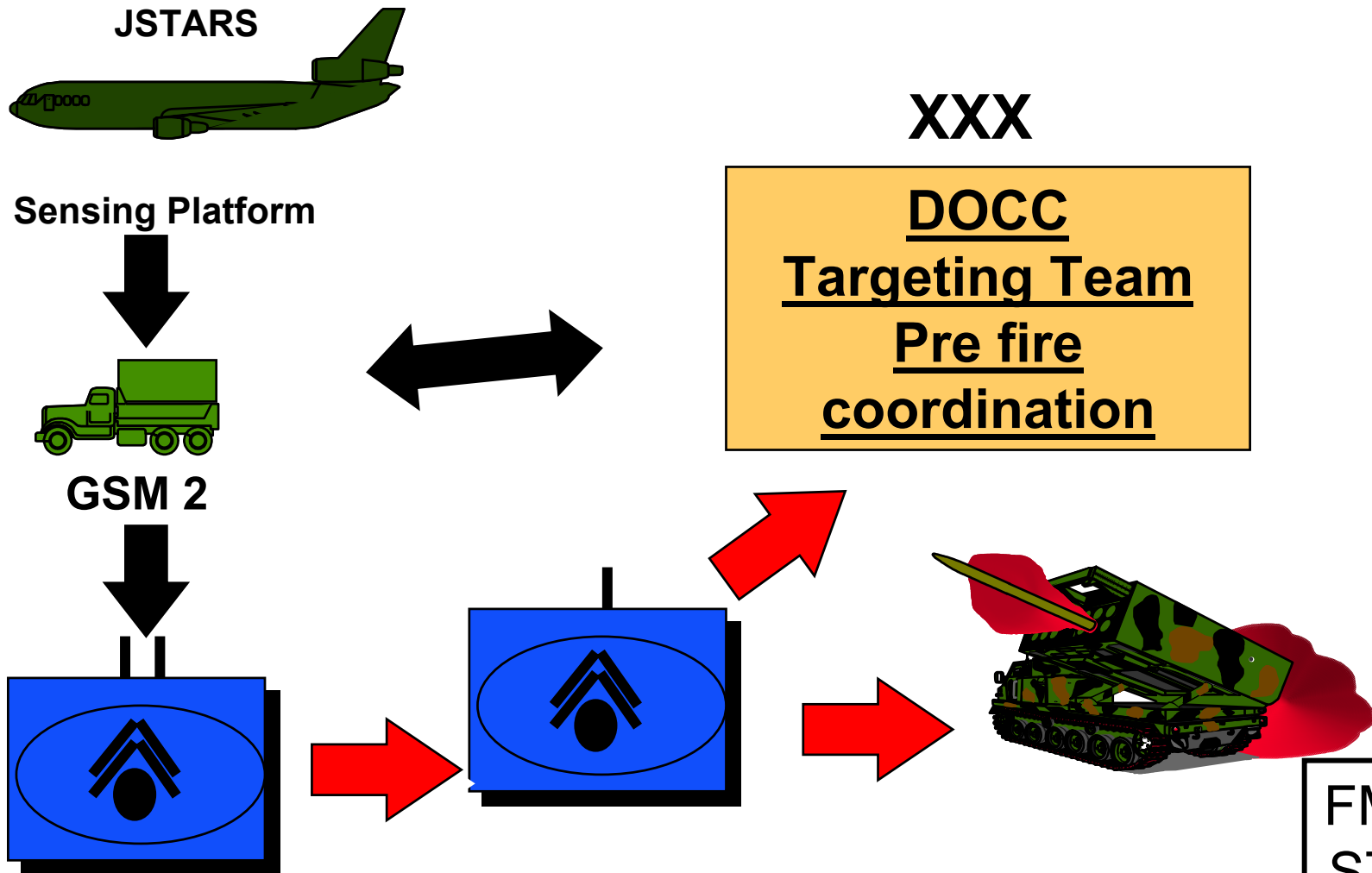


# ***Rockets (De-Centralized)***

## **M26 Tactical Rockets**

- Normally fired at targets within Division's AO
- Fired by Divisional MLRS BN/Btry, attached MLRS BN or Reinforcing FA Brigade
- Generally, under the control of DIVARTY

# *Decentralized Execution*



FM 6-20-10  
ST 6-60-30  
FM 3-09.60

*CAPABILITIES  
AND  
LIMITATIONS*

# ***Capabilities***

- Each launcher can engage a large target area
- Complements cannon with extended range and volume of fire
- Can engage up to 6 aim points per target
- Can have up to 3 active fire missions at a time
- Excellent counter battery weapon

# ***Limitations***

- Requires a large operational area
- Long reload times (20 minutes under extreme conditions)
- Has a large danger close distance (2000M)
- Can shoot faster than resupply
- Effects are reduced when firing into areas with overhead cover
- Limited types of ammunition
- Not useful when high degrees of accuracy are required
- Limited Crew Serve Weapons

# *MLRS SPECIAL TACTICS*

# ***Cross-FLOT Raid***

- MLRS maneuver forward of the FLOT
- Allows MLRS units to strike deeper
- Extremely effective method to disrupt the enemy's C<sup>2</sup> and artillery operations
- MLRS units are in high risk of enemy contact and enemy counter battery fires
- Maneuver forces needed to increase MLRS survival



# ***Sensor-to-Shooter***

- Fire mission processing times reduced drastically
- Target transmitted directly from sensor to the BOC
- Very effective against counter battery fires and fleeting targets (SCUDS)
- Increases planning for MLRS unit and radar

# ***Stay Hot, Shoot Fast***

- Launchers lay on target in general direction of target for extended time
- Battery receives refined target location
- BOC sends launcher amended mission
- Response time is measured in seconds
- Leadership is concerned with launcher survivability on firing point

# ***Summary***

- Employment Considerations
- Tactical Missions
- Fire Direction Center responsibilities
- Control of MLRS Munitions
- Capabilities and Limitations
- Special Tactics

# Gunnery Department MLRS Division

*“Standards Start Here”*

